DOCUMENT RESUME

ED 377 963 PS 022 872

AUTHOR Liddiard, Hannah J.
TITLE The Academic Achievement of Second, Third, and Fourth Grade Regular Education Students Involved in Special Education Inclusion Programs.
PUB DATE Dec 91
NOTE 58p.; Paper submitted in partial fulfillment of the requirements for the degree, Specialist in Arts, Eastern Michigan University.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Academic Achievement; Classroom Environment; Comparative Analysis; *Disabilities; Elementary Education; *Elementary School Students; Grade 2; Grade 3; Grade 4; Grouping (Instructional Purposes); *Inclusive Schools; Mathematics Achievement; Noncategorical Education; Reading Comprehension; Sex Differences; *Special Education; *Special Needs Students
IDENTIFIERS Education for All Handicapped Children Act; Michigan

ABSTRACT

This study investigated the differences in academic achievement of regular education students in noninclusion classrooms and of same-grade students in special education inclusion programs, to assess the impact on regular education achievement of inclusion programs in a particular elementary school. All subjects were second, third, or fourth grade regular education students attending Bates Elementary School in Dexter (Michigan) during the 1989-91 school years. Each classroom was ranked as inclusive, noninclusive, or unacceptable for use in either sample. The results showed that the noninclusion regular education students did not exceed the academic growth of their counterparts who participated in inclusion programs on either reading or mathematics incremental change measures. Under the circumstances described for inclusion classrooms, regular education students' academic achievement was not negatively affected. The varying levels of means among the three grade levels could result from factors other than the treatment experienced by each group. Results suggest that concern for regular education students' academic progress should not deter educators from initiating special education full-inclusion programs. Contains 49 references. (AP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 377 963

THE ACADEMIC ACHIEVEMENT OF SECOND, THIRD, AND FOURTH GRADE REGULAR EDUCATION STUDENTS INVOLVED IN SPECIAL EDUCATION INCLUSION PROGRAMS

by

Hannah J. Liddiard

B. S., Eastern Michigan University, 1973
M. A., Eastern Michigan University, 1978

Submitted in Partial Fulfillment of the
Requirements for the Degree,
Specialist in Arts

Department of Leadership and Counseling
Program in Educational Leadership
College of Education
Eastern Michigan University
December, 1991

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Hannah J. Liddiard
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

PS 022872

Copyright 1991

First Place, Graduate Deans' Award for Research Excellence April 1992

BEST COPY AVAILABLE

Table of Contents

Page

List of Tables v

Chapter

1. The Nature and Purpose of the Investigation 1

Introduction 1

Need for the Study 2

Purpose of the Study 3

Delimitations 3

Theoretical Framework 4

Basic Assumptions 4

Definitions 5

Specific Questions 8

Statement of Procedures 8

2. Review of Related Literature 9

Findings of Other Researchers 9

Summary 25

3. Methodology, Presentation, and Analysis of the Data 27

Methodology Used in Data Collection 27

Subjects 27

Data Collection Procedures 29

Presentation and Analysis of Data 31

4. Conclusions and Recommendations 39

Conclusions 39

Recommendations 43

References 47

Tables

Page

Table

1. Group Pretest, Posttest, and Incremental Change Means 32

2. Results of Two-Tailed *t* Test of Pretest NCE Means in Reading and Mathematics 33

3. Results of Two-Tailed *t* Test of Mean NCE Incremental Change in Reading and Mathematics 34

4. Results of Two-Tailed *t* Test of Reading Incremental Change Means by Treatment Group and Grade Level 35

5. Results of Two-Tailed *t* Test of Mathematics Incremental Change Means by Treatment Group and Grade Level 36

6. Results of Two-Tailed *t* Test of Incremental Change Means for Reading by Treatment Group and Sex 37

7. Results of Two-Tailed *t* Test of Incremental Change Means for Mathematics by Treatment Group and Sex 38

CHAPTER ONE

The Nature and Purpose of the Investigation

A landmark piece of federal legislation was enacted in 1975. Public Law 94-142, the Education for All Handicapped Children Act, requires that children with handicapping conditions have access to public education programs within the least restrictive environment. Before this legislation took effect, many children were denied an education appropriate to their needs.

The parents of handicapped youngsters launched a campaign for equal access, based upon the same principles as the Civil Rights movement for racial equality. The passage of PL 94-142 set in motion a complex system of special education terms, procedures, and programs. Children identified as handicapped were placed in programs separate from regular education, often in completely separate schools. As educators developed their understanding of *least restrictive environment*, children began to be *mainstreamed* into a regular education classroom for a portion of their school day. While this was a great improvement over totally segregated programs, the underlying assumption still existed that handicapped children benefitted more from these specialized programs than they did from the regular classroom.

This assumption is still alive and well in many quarters. However, there is a growing body of research to show that handicapped children do not, in fact, make greater

academic progress in segregated programs. Even the concept of mainstreaming is now giving way to a new philosophy of *inclusion* for handicapped children. The underlying assumption of inclusion is that all children belong in their neighborhood school, in regular classrooms unless their handicap is so severe as to prevent any benefit to the child or undue disruption to the class. Inclusion also implies that there will be the appropriate level of support for that child to be successful in the regular classroom.

Michigan is just beginning to implement the concept of inclusion in its public schools. During the 1989-90 school year, a very few districts (mostly in Washtenaw County) had true inclusion programs in operation. The 1990-91 school year saw the expansion of those programs as well as first steps toward inclusion in several other school districts in the county and throughout Michigan (Powell, 1990).

Need for the Study

The Michigan State Board of Education has stated that inclusion is a desirable option in the education of handicapped youngsters whenever possible. Research has shown that mainstreaming improves the academic achievement of special education children; the early research on inclusion shows even greater gains. However, educators must also concern themselves with the potential impact upon the regular education students involved in inclusion classrooms. If inclusion programs are ever to be truly accepted as the norm by teachers, administrators, children, and parents, it is important to determine if regular education achievement is affected. The information obtained from this research

project will help educational leaders make sound decisions for the benefit of all of our students.

Purpose of the Study

Because inclusion as defined for this study is a fairly recent interpretation of the least restrictive environment concept, many educators are seeking data as to its effects upon academic achievement. There is a need to know if this service delivery system provides equal or greater gains for the special education child while showing no detriment to the regular education classmates' achievement.

The purpose of this study was to take a close look at the actual academic gain/loss over one school year for elementary regular education students in inclusion programs. The gain/loss of these students was compared with that of similar students not in inclusion programs to see if there was any impact upon regular education achievement. By analyzing the gain/loss for a specific school year rather than looking solely at end-of-year (post inclusion) achievement levels, an accurate measure of the impact of inclusion programs could be ascertained. This information will be helpful to teachers and administrators as they attempt to develop effective inclusion programs to meet the needs of all children.

Delimitations

Only a handful of Michigan school districts have begun to implement full inclusion. The subjects for this study were all drawn from the Dexter Community Schools' elementary population during the 1989-91 school years.

These students all attended Bates Elementary School in Dexter, Washtenaw County, Michigan (total enrollment in grades 2-4 was approximately 460 each year).

It is recognized that Dexter is a predominantly middle class community as shown by its out-of-formula status for state financial aid. This limits the validity of generalizing the results of the study to in-formula districts. The student body is almost entirely Caucasian. The researcher further recognizes that drawing subjects from only one elementary school allows the possibility of bias from local factors (such as curriculum, staffing, class size, amount of parent/community support, etc.). It should be noted that the teachers in the inclusion rooms made extensive use of a manipulative mathematics program to supplement the regular mathematics textbook for all students (the same curriculum/concepts were taught in all classes within a grade level). While several other teachers in this school have also been trained in this manipulative mathematics program, its use was not as consistent in the noninclusion rooms.

Further, the teachers in these early programs typically became involved on a voluntary basis because of their beliefs about integrated education for all children. Therefore, these teachers may not represent the broad range of teaching style or ability.

Theoretical Framework

Basic assumptions. It was assumed that special education students who participated in inclusion programs showed academic achievement equal to or greater than similar students in noninclusion placements. Further, it was

assumed that the curriculum for both the experimental and the control group was the same across any grade level. It was also assumed that regular education students were randomly assigned to either inclusion or noninclusion classrooms for the 1989-91 school years. The final assumption was that each student in the sample for both groups would have a standardized test score in Total Reading and Total Mathematics for both pretest and posttest.

Definitions. The following definitions were used in this study:

Least Restrictive Environment (LRE) is a legal term defined under both Michigan state and federal law. It means that handicapped children must be educated with nonhandicapped children to the maximum extent appropriate considering several factors.

Regular Education Initiative (REI) is not a legal term and therefore has differing definitions. It is the philosophy/policy of integrating into regular education classes all students with special needs, including those previously served in bilingual and special education.

Mainstreaming is not a legal term. It is the integration of the more mildly handicapped students into regular education classrooms for all or part of the school day. The teacher does not receive additional help in the classroom from support personnel during this time.

Inclusion (or inclusive education) is not a legal term. It refers to the philosophy/policy of integrating all handicapped students, including those with severe impairments, into the regular education classroom for a substantial portion of the student's day. For the purposes of this study, the definition of

inclusion required the presence of additional certified or support personnel in the classroom for at least 75% of the time that the included student(s)were present.

(The above definitions are based upon those given by Beekman, 1990.)

Inclusion Classroom was defined as a public school classroom wherein inclusion was taking place for at least 75% of the normal school day. Lunchtime, recess, and special classes such as art, music, and physical education were counted as inclusion time if the handicapped student(s) participated.

Noninclusion Classroom was defined as a public school classroom in which no amount of inclusion was taking place.

Special Education Students were defined as those who had been declared eligible for services through an Individual Educational Planning Commitee (IEPC) and were receiving special education services during part or all of the 1989-91 school years.

Regular Education Students were those who had not been declared eligible for special education services through an IEPC and were not receiving special education services at any time during the 1989-91 school years. The only exceptions to this guideline were children who received speech articulation services; while they did require an IEPC to receive such services, they were not defined as handicapped students for this study.

Academic Achievement was defined as the Normal Curve Equivalent (NCE) scores obtained from the nationally normed standardized California Achievement

Test for grades one through four. The scores for Total Reading and Total Mathematics were used to determine the level of academic achievement.

Incremental Change was the difference in NCE score from one year to the next on any particular achievement test. For instance, if a child obtained an NCE score of 58.1 in Total Reading in spring 1989 and 67.7 on the same section in spring 1990, then there would have been an incremental change of +9.6. If a child scored 86.9 on Total Mathematics in spring 1990 and 79.6 in spring 1991, then the incremental change would have been -7.3. It was possible to have an incremental change of zero, if the NCE score were exactly the same from one year to the next.

In-Formula School District was defined as a Michigan public school system without sufficient tax base (known as State Equalized Value or SEV) to provide a state defined minimum amount of money per student to be educated in the district. These districts received general state aid payments to supplement their locally obtained funds to the minimum spending per pupil level.

Out-of-Formula School District was defined as a Michigan public school system with sufficient tax base (SEV) to provide an adequate number of dollars per student in the district without receiving general state aid payments. Most out-of-formula districts still received some state funds for categorical (specific) programs.

Specific Questions

This study sought to retain the following hypothesis: The academic achievement of second, third, and fourth grade regular education students in noninclusion classrooms does not exceed that of similar students involved in special education inclusion programs. What effect, if any, does participation in an inclusion program have on academic achievement of elementary regular education students?

Statement of Procedures

To test this hypothesis, academic progress over one school year was compared for two groups of regular education students. The experimental group consisted of subjects who had participated in full inclusion classrooms. The control group subjects were students from the same elementary school who had not participated in inclusion programs at all during that school year.

All subjects' gains/losses in Total Reading and Total Mathematics were assessed. Pre- and posttest measures on the nationally standardized California Achievement Test were used. The mean growth (change) was compared for each academic area with a two-tailed *t* test for independent groups. Subgroup comparisons by sex and grade level were also analyzed.

CHAPTER TWO

Review of Related Literature

The history of American public education has involved a continuing tension between inclusion and exclusion of certain groups of citizens. Girls, minorities, noncitizens, nonlandowners, and the handicapped were all excluded from free public education at some point. As the value of an educated populace was more fully recognized, these groups were gradually incorporated into the public school system.

Gartner and Lipsky (1987) provide a concise history of the movement to provide handicapped children with an appropriate education. They state that the landmark Civil Rights case Brown v. Board of Education (347 U. S. 483) provided the impetus for improved opportunities for the handicapped. Brown's concepts of the "importance of education to the 'life and minds' of children" and the "inherent inequality of separate education" (p. 368) were extended to the context of handicapped persons. In 1971, Pennsylvania Association of Retarded Citizens (PARC) v. Commonwealth of Pennsylvania (334 F. Supp. 1257) overturned a state law relieving school districts from the responsibility of enrolling "uneducable" or "untrainable" children. This decision was based upon the premise that retarded children could, indeed, benefit from education. Further, in Mills v. Board of Education (348 F. Supp. 866), a federal court ruled that a school district's financial constraints could not be used as justification for excluding handicapped children. In other words, these children could not be treated as the last priority in budget decisions.

With the passage of Public Law 94-142, The Education for All Handicapped Children Act, the law requires that "removal from the regular education environment" is to occur "only when the nature and severity of the handicap is such that education in regular classes with the use of supplementary aids cannot be achieved satisfactorily" (1975, Sec. 612 [5] [B]). All students are to be educated in the least restrictive environment (LRE) appropriate for their needs.

Gartner and Lipsky chronicle the gradual changes in the interpretation of the LRE concept, and several alternative service delivery systems are discussed. Early attempts to meet the intent of LRE resulted in segregated special education programs. Special education teachers worked with handicapped students for some or all of their academic instruction. Gradually, many handicapped students were *mainstreamed* into regular education classrooms for part of their school day. The special education teacher retained the responsibility for these students' progress, however, and no extra support was provided to the classroom teacher when the handicapped children were present in their rooms. Thus, PL 94-142 "seems to have supported the development of a dual structure with elaborate protections to ensure the rights of disabled students but in a separate delivery system out of the mainstream" (Lipsky & Gartner, 1989, p. 9).

Special education efficacy studies, however, began to indicate that there were few, if any, positive effects for students of all levels of severity placed in special education settings. In fact,

> the basic premise of special education is that students with deficits will benefit from a unique body of knowledge and from smaller classes staffed by specially trained teachers using special materials. But there is no compelling body of evidence demonstrating that segregated special education programs have significant benefits for students. On the contrary, there is substantial and growing evidence that suggests the opposite is true. (Lipsky & Gartner, 1989, p. 19)

Madden and Slavin (1983) reviewed the methodically adequate research on academic and social outcomes of special and regular class placement for handicapped youngsters. They found that "the research on achievement generally fails to support the instructional effectiveness of special class placement" (p. 522). They further concluded that the best placement "is in a regular class using individualized instruction or in a regular class supplemented by well-designed resource support." Epps and Tindal (1987) and Leinhardt, Bickel and Pallay (1982) concur.

Other researchers have examined the relative merits of segregated, part-time mainstreamed, and full-time mainstreamed programs. Wang and Baker (1985) analyzed eleven empirical studies of the effects of mainstreaming published between 1975-1984. The basic finding was that "mainstreamed disabled students consistently outperformed nonmainstreamed students with comparable special education classifications" (p. 503). The data suggested that full-time mainstream settings resulted in greater positive outcomes than

part-time placements. The studies reviewed support "the effectiveness of mainstreaming in improving performance, attitudinal, and process outcomes for handicapped students" (p. 517). In fact, nearly all available research reviews indicate better educational outcomes associated with integrated placements as compared to their segregated counterparts (Sailor, Goetz, Anderson, Hunt & Gee, 1988; Larter, 1982; Zigmond & Baker, 1990; Baker, Padeliadu & Zigmond, 1990; Wang & Birch, 1984).

Educators, therefore, have recently taken steps toward an integrated approach to providing quality education for all students. Common terms used for this integration are *inclusion, inclusive education,* or the *Regular Education Initiative (REI).* "We have begun to analyze how we might go about integrating or merging special and regular education personnel, programs, and resources to design a unified, comprehensive regular education system capable of meeting the unique needs of all students in the mainstream of regular education" (Stainback & Stainback, 1989, p. 41). Madeline Will, Assistant U. S. Secretary of Special Education and Rehabilitation Services, stated that "the heart of this commitment is the search for ways to serve as many of these children as possible in the regular classroom by encouraging special education and other special programs to form a partnership with regular educators" (1986, p. 20).

As with any developing educational philosophy, professionals in the field are struggling to define what it is that represents "best practice" in implementing inclusion programs. Lipsky and Gartner (1989) propose that all inclusion models have "two major factors in common: 1) acceptance of

responsibility by teachers for a diverse group of students and 2) development of classroom organizations and instructional strategies that see opportunities, not impediments, in the integration of students with disabilities into the mainstream classroom" (p. xxvi). They also offer a set of shared values believed to lead toward both excellence and equity.

Several authors describe the philosophy of inclusion and offer examples of its implementation. Richard Reid (1987) gives details of the Vermont Homecoming Model and discusses the benefits of educating learning impaired students in their local schools with nondisabled peers. Jacqueline Thousand (1987) describes best educational practices and their indicators. Marsha Forest (1988) and Forest and Lusthaus (n.d.) develop a picture of inclusion in several Canadian school districts, where the word *belonging* is the key. The criterion for membership into the regular class and the community at large is breathing. The heart of this integration program is the *circle of friends* concept wherein nondisabled peers provide an effective support network for the included student. Viadero (1989) describes the experience of a blind first grade child included in a regular education room for the entire school day. Sailor (1989) promotes the concept of a *comprehensive local school model*, offering six special characteristics as a definition of integration for students with severe handicaps. Sailor et al. (1989) expands this model further.

It is realistic, however, to recognize that not all professionals are embracing the concept of inclusion. Both regular and special education teachers are anxious about its potential effects on their respective students. After nearly

twenty years of a separate special education system, it will take time, trust, and cooperation to develop truly integrated programs. Sapon-Shevin (1988) addresses this topic in Working Towards Merger Together: Seeing Beyond Distrust and Fear. Concerns center around issues such as disagreement on the efficacy of current programs, defensiveness about existing systems, and lack of a clear notion of what integration should be like. Marchetti (1991) expresses critics' fears that special education students will not get enough attention in regular classes, that the handicapped students can be disruptive, and that regular classroom teachers are not trained to handle the special children's needs. Parents of autistic children recently fought to avert the closing of a specialized school in Garden City, Michigan, citing fears that their children would be harmed by the change to integrated programs in their home districts (Trimer, 1990).

Another concern is less often expressed publicly, but it has the potential to undermine inclusion efforts in the long run. This is the fear of teachers, administrators, and parents that their regular education children's academic progress will be negatively impacted by their participation in inclusion classrooms. There is very little research available to provide assurance that regular education students' progress is not sacrificed in order to provide the advantages of integration for the special education students.

Because inclusion, as defined for the current study, is such a new interpretation of least restrictive environment, research to examine its impact is truly in its infancy. The information that does exist often relates to a mainstreamed, rather than an inclusive, situation. It is important that the

reader have a clear understanding of the difference between mainstreaming and inclusion as the existing studies are reviewed. Mainstreaming is the placement of more mildly handicapped students into regular education classrooms for all or part of the school day; the classroom teacher does not receive additional help in the classroom from support personnel during this time. The special education teacher retains responsibility for the academic progress of the mainstreamed student. Inclusion, on the other hand, implies the integration of the handicapped child as an equal member of the regular education classroom. He/she belongs there and is expected to participate in the life and activities of the class to the fullest extent allowed by his/her disability. Support staff, such as classroom aides or special education team teachers, provide whatever classroom support is necessary in order for the included child to be successful. The classroom teacher shares the responsibility for the special education student's progress; regular and special education teachers work together toward the common goal of quality education for all students in the classroom.

With this understanding of the concepts of mainstreaming and inclusion, a review of the existing studies that address their impact on the achievement of regular education students is in order.

During the 1989-90 school year, the Saline Area Schools in Washtenaw County, Michigan, began welcoming back students with disabilities from specialized programs. Saline worked closely with Dr. Barbara LeRoy from the Center for Inclusive Education at Wayne State University, Detroit. The ten handicapped students represented a variety of impairments: educably mentally

impaired, severely multiply impaired, severely mentally impaired, trainable mentally impaired, physically or otherwise health impaired, and autistically impaired. They were placed in age appropriate classrooms ranging from kindergarten to sixth grade. All of the handicapped students received the majority of their academic instruction in the regular education classroom. These inclusion classrooms were supported by 6.5 aides and three transition specialists who provided consultation services. Dr. LeRoy (1990) gives an overview of the results of this first year of inclusion in a report entitled The Effect of Classroom Integration on Teacher and Student Attitudes, Behavior, and Performance in Saline Area Schools. The academic performance of first and fifth grade regular education students was assessed with year-end standardized instruments (Gates-MacGinitie for grade one, California Achievement Test for grade five). A student *t* test compared the achievement of inclusion room general education students with comparable same grade nonintegrated classrooms. LeRoy found that there were no significant differences in the regular education achievement between integrated and nonintegrated situations, with one exception. One integrated fifth grade classroom had significantly higher achievement scores ($x = 89.4$) than its control nonintegrated classroom. LeRoy attibutes this difference largely to teacher style and motivation. This report also provides interesting insights into outcomes other than achievement (teacher and student attitudes, changes in behavior, perceived adjustments needed for the future, etc.).

Missouri state education personnel have worked cooperatively with local school districts to develop an experimental program that brings special education staff as team teachers into regular education classrooms. The program is called Class Within a Class (CWC) and is designed more for later elementary through high school content courses. From a beginning pilot program involving two school districts, CWC has spread to some 50 of 545 Missouri districts. State personnel continue to be closely involved to ensure that any district that wants to attempt it is committed and prepared to help the program succeed. Typically, the classroom teacher delivers content instruction while the special educator "modifies presentations and helps students acquire and apply learning strategies that enable them to grasp the material or successfully complete assignments" (Morrow, p. 11). The course content is not watered down because of the CWC program; these classrooms have the same goals and objectives as other classes in the district. Educators involved have found that students need at least a fourth grade reading level and other minimal skills. Some students may also require separate direct instruction on learning strategies with a special education teacher. Preliminary research results on CWC were presented to the Missouri Board of Education in November, 1990. (Quantitative, statistical analysis is still in progress as of this writing.) Fifteen schools provided a sample of both CWC and control group classrooms. Data were collected for 700 students in grades 2-10 to assess achievement, student/teacher interaction, self concept, and self esteem. Achievement results showed reading and math "increases for both groups of students; math gains were higher. Throughout the school year,

students with disabilities were able to maintain average achievement in the regular classroom with the CWC . . . regular students in CWC made greater gains than control groups on all measures" (p. 11). The Instructional Materials Laboratory at the University of Missouri-Columbia (1989a, 1989b, & 1989c), in cooperation with the Missouri State Department of Education, has put together a set of staff development materials for districts interested in implementing a similar program. These materials also contain an extensive bibliography on integrated education. Video tapes about Class Within a Class at both the elementary and secondary level are available through the Instructional Materials Laboratory.

Baker and Zigmond (1990) looked at the impact on regular education students and teachers when learning disabled students were mainstreamed full-time as part of Project MELD (Zigmond & Baker, 1990). They sought to determine if teachers would spend an inordinate amount of time with the mainstreamed handicapped students and whether nonhandicapped students would spend less time engaged in academic tasks. The study was conducted in a large, urban school district. The elementary school involved served a predominantly Black population from a low socio-economic neighborhood. Teachers and students were observed during the year before program implementation to determine baseline behavioral data. Observations were conducted again one year later after the LD students had been mainstreamed for eight months. The frequency of certain student and teacher behaviors were noted during both sets of observations. Each of five homerooms was observed four times during reading

period and four times during math period (the same teachers were observed both years). Two significant differences were found during the reading period: time spent with worksheets was significantly reduced in the implementation year and there was a significant reduction in non-instruction time (p. 8). The math class observations also showed two significant differences during the implementation year: regular class students spent less time assigned to workbooks and worksheets and significantly less time off-task (p. 9). There were no significant changes in teacher behavior throughout the study. Baker and Zigmond state that ". . . the addition of LD students to the mainstream class . . . did not result in a decrease in time nonhandicapped peers are actively engaged in instruction, nor a decrease in time students were monitored by the teacher, nor a decrease in whole class activities taught by the teacher, as feared by school personnel" (p. 11). The authors summarize that increased integration need not cause deterioration of instruction nor an increase of off-task behavior by regular students--learning disabled "students do not distract teachers and students from the learning that is taking place" (p. 12).

Kishi (1989) reports on the Stanford Achievement Scores for Hawaiian students for both pre- and post-integration. The state of Hawaii consists of one large school district, and PL 94-142 was initially interpreted there in 1975 to mean inclusion (not mainstreaming). Therefore, it was possible to gather data over a span of twelve years for general education students who had grown up in integrated classrooms. Special education students included both those with severe multiple handicaps as well as students with moderate disabilities.

Pre-integration achievement scores were gathered in 1976-1977 for grades 4, 6, 8, and 10. Post-integration data were drawn from the same schools/grades in 1988-1989. Results indicate that students' test scores were not affected by integration and, in general, all students' scores improved over this twelve-year period. The author is careful not to claim that integration caused higher general education scores, citing other factors such as curriculum changes, teacher effectiveness training, and school improvement projects. However, it seems safe to say that the inclusion of youngsters with severe handicaps did not have a negative impact on regular education students' achievement.

Kozleski (1988) conducted a study examining the effects of full integration on a severely disabled elementary student and her classmates. The California Test of Basic Skills was used to evaluate the achievement of the regular education students. Over two consecutive years, the results showed no significant difference in achievement between this inclusion class and that of noninclusion rooms in the same school.

In a video tape called Schools Are For All Kids: Perspectives from Principals, Kelly, Karasoff, and Haring (1990) report on telephone and onsite interviews conducted throughout the United States. Fifteen principals, involved in full integration programs, discuss the benefits they believe to occur for regular education students. Several principals cited such positive outcomes as "improved school climate, better student attendance, better staff attendance,

higher student achievement, and attitudinal changes or 'a caring among students for one another'" (LeRoy, n.d.).

Odam, DeKlyen, and Jenkins (1984) conducted an experimental study to determine the developmental impact on nonhandicapped preschoolers integrated in largely handicapped programs. Four nonhandicapped children were placed with eight special education preschoolers in each of four integrated classes. Control groups were chosen from a nearby nonintegrated cooperative preschool. Children in each group were given a battery of developmental assessments twice, once in the early fall and again in late May or June of the school year in question. An analysis of variance was performed on the pretest means for each dependent variable. To adjust for any initial differences, an analysis of covariance was used for each posttest mean with the pretest of each measure as a covariate. Results indicated that mean group performance did not differ significantly for any measure. The nonhandicapped children in this sample did not appear to be negatively affected by the integrated classes and exposure to a large number of handicapped peers. The normal acquisition of developmental skills appeared to be uninterrupted. The authors urge caution in interpreting these results due to the small sample size and the highly structured environments of both the integrated and nonintegrated preschool programs.

Affleck, Madge, Adams, and Lowenbraun (1988) studied the comparative benefits of integrated classroom and resource room models. The Integrated Classroom Model (ICM) was developed as an option for mildly handicapped students. The study involved thirteen classrooms in three buildings, ranging

from first to sixth grade. The classes consisted of approximately 1/3 mildly handicapped (learning disabled, educably mentally impaired, seriously behaviorally disabled) and 2/3 average to above average regular education students. ICM teachers were either former special education self-contained/ resource teachers or former regular education teachers with extra special education training. A classroom aide was provided for 1/2 to 3 hours per day, depending upon the number of special education students. The Integrated Classroom Model teachers identified four best practices: complete inclusion of the special education students so that they were not singled out from the group, the majority of teacher time spent on active instruction, at least a 2:1 ratio of positive to negative comments from the teacher, and adaptation of materials by the teacher for individual instruction. Special education achievement showed virtually no difference between gains/losses for the ICM and resource program, with the integrated program showing positive benefits in areas other than achievement. The regular education students' achievement was assessed using a California Achievement Test battery in the fall of two consecutive years. There was no significant difference in their achievement as compared to their counterparts in nonintegrated classrooms. The ICM was deemed to be at least as effective as the resource model, while providing a less restrictive environment at less overall cost. The authors state that the ICM should not be the only alternative available in a school, and that the results may not be generalizable to urban, rural, or culturally diverse settings.

David Johnson (1982) provides summaries of seventeen studies conducted to examine ways to ensure full participation of handicapped students in the regular classroom. The studies were carried out over a three-year period to gather evidence on the efficacy of mainstreaming. The special education students included the severely handicapped, hearing impaired, mildly retarded, and learning disabled. Of particular interest was the role of competitive, cooperative, and individualistic learning experiences on a variety of outcomes. The cooperative learning approach was shown to be more effective in encouraging active participation/interaction by the handicapped students. The cooperative situation was also shown to have positive benefits in promoting achievement and self-esteem in handicapped youngsters and in developing positive relationships with nonhandicapped students during free time.

One of these studies, conducted by Johnson and Johnson (1982), dealt with the effects of cooperative and individualistic models on the relationships and performance of handicapped and nonhandicapped students. Specific questions examined were whether the handicapped students would be ignored or rejected, whether the handicapped students would disrupt the work and decrease the achievement of the regular education students, and whether the nonhandicapped students would benefit in any way from contact with their handicapped peers. The subjects were 31 students in an eleventh grade mathematics class in a midwestern metropolitan district. Three students were classified as having severe learning and behavioral problems and three were classified as educably mentally retarded. They were assigned to cooperative or individualistic

conditions on a stratified random basis controlling for sex, ability, and handicap. Students received instruction for 55 minutes daily over 16 instructional days. At the end of the study, identical achievement tests were given to students in each condition. Achievement measures indicated that the cooperative approach resulted in higher achievement on the part of both handicapped and nonhandicapped students. Measures of other outcomes showed that the cooperative model encouraged more cross-handicapped interaction during instruction and more interpersonal attraction between handicapped and nonhandicapped students. The author states that these results would indicate that placement of handicapped individuals in regular classrooms will not inhibit the achievement of nonhandicapped students. Further, the nonhandicapped students who worked collaboratively with the special education students were more able to take the perspective of their handicapped peers than students who worked individually in the same class as handicapped students. This may provide important developmental experiences for nonhandicapped students.

A related study was conducted by Smith, Johnson, and Johnson (1982). The effects of cooperative and individualistic learning situations were compared for achievement of academically handicapped, normal-progress, and gifted students. Fifty-five sixth grade students from a midwestern, suburban, middle school participated (7 handicapped, 14 gifted, 34 regular students). They were stratified for sex and ability and assigned randomly to a condition. Each group received five days, 65 minutes/day of instruction in a social studies unit. Achievement was tested on the fifth day and again four weeks later to determine

the amount of retention. The results indicate that students of all ability levels in the cooperative situation achieved higher on both the achievement test and the retention test than did the students in the individualistic model ($p < .01$). "Educators and psychologists who fear that the achievement of normal-progress and gifted students will be lower when they work with handicapped students . . . may experience some relief from these results" (p. 282). Participation in heterogeneous cooperative groups increased the achievement of all three types of students. The authors state that "the achievement results are all the more important as this may be the first study to include academically gifted and handicapped students in the same conditions" (p. 282).

Although it is difficult to determine whether some of the above described integration studies involved *mainstreaming* or *inclusion* (as defined for the current research), the overall trend seems clear. In every applicable study, the regular education students in integrated situations achieved at least as well as their counterparts in nonintegrated classrooms. In some instances, the general education students in integrated settings had higher achievement than their nonintegrated peers. Most of the studies relied on a treatment/posttest design, taking a single measure of achievement after the integrated instruction. One exception is Baker and Zigmond (1990) where pre- and post-integration behavioral observations were conducted to assess the impact of integrating learning disabled students. The other exception is the study of preschool developmental gains conducted by Odam, DeKlyen, and Jenkins. Here, the

researchers used a pretest/posttest design to assess the impact of integration over one school year.

CHAPTER THREE

Methodology, Presentation, and Analysis of the Data

Methodology Used in Data Collection

Subjects. All subjects in this study were second, third, or fourth grade regular education students attending Bates Elementary School in Dexter, Michigan, during the 1989-91 school years. All subjects were considered as members of specific classrooms. Each classroom was determined to be one of three types: 1) inclusion, as defined for this study, 2) noninclusion (no amount of inclusion occurring), or 3) unacceptable for use in either sample due to the presence of part-time inclusion (not enough to qualify as an inclusion room as defined). Through this process, 4 inclusion rooms and 14 noninclusion rooms were identified. Subjects from two classrooms could not be used for either sample. The grade level distributions are shown below:

Grade	Type of Classroom		
	Inclusion	Noninclusion	Neither
2	1	6	0
3	1	5	0
4	2	3	2 .

All classrooms were from the 1990-91 school year except for one fourth grade from 1989-90. In this manner, subjects were identified and samples drawn to create two samples of 84 subjects each and matched for sex.

The four inclusion rooms were configured as follows. During the 1989-90 school year, a regular fourth grade classroom teacher and a special education teacher of the Autistically Impaired formed a full-time team. Three autistic students, one of whom was blind, were included for the entire school day. This class also included one Educably Mentally Impaired child and two moderately Emotionally Impaired students. A consultant for the Visually Impaired worked within the classroom as much as posssible to teach Braille and communication skills to the blind student (mobility training often took place in the hallways). There were 21 regular education students in this room identified for the inclusion sample.

A second grade classroom (1990-91) included two severely learning disabled students for the entire day. A special education teacher for learning disabilities team taught for specific portions of the day (mainly during reading and mathematics primary instruction). A paraprofessional was present to provide special education support for most of the remainder of the school day. There were 23 regular education students, 1 of whom could not be placed in the inclusion sample due to lack of pretest data.

A third grade classroom (1990-91) included three severely learning disabled students with the same special education teacher/model as described for

the second grade class above. There were 23 regular education students, with 2 students lacking the necessary pretest data for use in the inclusion sample.

A fourth grade classroom (1990-91) included four severely learning disabled students with the same special education teacher/model as described for the previous two classrooms. This class also included a medically fragile/ wheelchair bound child who had previously been placed in a regional special education facility. There were 24 regular education students, 4 of whom lacked the necessary pretest data.

The sample of noninclusion regular education students was drawn from Bates Elementary's 1990-91 students only. Since there were no significant curriculum or social changes from 1989-90 to 1990-91, the researcher determined that a valid sample of noninclusion fourth graders could be drawn from 1990-91 only (even though one inclusion room cluster sample came from the 1989-90 school year). Selecting noninclusion students from the same school as the experimental inclusion classrooms helped to control for socioeconomic and ethnic factors. The total population of noninclusion students was 300 (2nd = 127, 3rd = 101, 4th = 72).

Data collection procedures. Cluster sampling was used for the regular education students in the four inclusion rooms (N = 84). A stratified random sample of noninclusion students was selected. The noninclusion sample was matched at each grade level with its corresponding cluster sample according to sex. Every twelfth name on the list of available noninclusion students by grade

was used to develop the stratified random sample. The resulting samples for the inclusion and noninclusion groups each contained:

Grade Level	Girls	Boys
2	11	11
3	12	9
4	24	17
Total	47	37 .

The California Achievement Test (CAT), 1986, Form E, Levels 11-14, was used to obtain standardized measures. All tests were computer scored by CTB McGraw-Hill, with the exception of the second grade pretest (Level 11) which was handscored. The CAT is a nationally normed set of group achievement tests which report individual scores in standard scores, local and national percentiles, grade equivalents, and national curve equivalents. The scores used for this study were national curve equivalents (NCE) because they are interval scores which can be averaged across groups. Because the interval distance between each NCE score is the same, these scores can be used to obtain an accurate picture of academic growth from one year to the next. Thus, incremental change in reading or mathematics can be ascertained for each student. (In contrast, the distance between percentile scores varies according to the bell curve distribution so they cannot be used to obtain group means or individual incremental growth.)

Pretest scores in both Total Reading and Total Mathematics were recorded for each subject. Pretest scores were obtained from CAT tests taken in the spring

(April) before the inclusion/noninclusion treatment school year. The Total Reading score was an average of performance on the Vocabulary and Comprehension subtests. The Total Mathematics score was an average of the Computation and the Concepts and Application subtest scores.

Posttest scores were recorded for each subject on the same CAT sections in the spring of the treatment year (again in April). The incremental change for each subject in Total Reading and Total Mathematics NCE score was calculated. Other data collected for each subject included grade level, sex, and treatment group.

Presentation and Analysis of Data

Group mean NCE scores were determined for pretest baseline, posttest, and incremental change in both Total Reading and Total Mathematics. Table 1 shows these three means for the inclusion and noninclusion groups.

A microcomputer program called Kwikstat 2.00 (TexaSoft, 1988) was used to develop all the inferential statistics discussed below. A two-tailed *t* test for unmatched groups was used to determine if there was a statistically significant difference between pretest means. Table 2 show the results of the *t* tests for Reading and Mathematics pretest means.

Table 1

Group Pretest, Posttest, and Incremental Change Means

Group[a]	Mean NCE Score		
	Pretest	Posttest	Incremental Change
Inclusion			
Reading	59.21	62.26	3.05
Mathematics	61.05	68.92	7.87
Noninclusion			
Reading	58.87	61.58	2.71
Mathematics	61.11	63.10	1.99

[a] $n = 84$ for each group.

Table 2

Results of Two-Tailed *t* Test of Pretest NCE Means in Reading and Mathematics

Group[a]	*M*	*SD*	*DF*	*t*
		Reading		
Inclusion	59.21	19.48	166	.11*
Noninclusion	58.87	20.20		
		Mathematics		
Inclusion	61.05	17.42	166	-.03**
Noninclusion	61.11	16.64		

[a] n = 84 for each group.

*p = .91

**p = .98

A two-tailed *t* test for unmatched groups was used to analyze the difference between incremental change means in Reading and Mathematics to see if there was a statistically significant difference. Table 3 shows the results of this *t* test.

Table 3

Results of Two-Tailed *t* Test of Mean NCE Incremental Change in Reading and Mathematics

Group[a]	*M*	*SD*	*DF*	*t*
		Reading		
Inclusion	3.05	14.08	166	.17*
Noninclusion	2.71	11.61		
		Mathematics		
Inclusion	7.87	15.09	166	2.51**
Noninclusion	1.99	15.29		

*p = .863

[a] $n = 84$ for each group.

**p = .013

Each grade level (second, third, and fourth) was then analyzed as a subgroup to see if there were significant differences in incremental change means between inclusion and noninclusion treatments. A *t* test for unmatched groups was used. Table 4 and Table 5 show the results for Reading and Mathematics respectively.

Table 4

Results of Two-Tailed *t* Test of Reading Incremental Change Means by Treatment Group and Grade Level

Group	*M*	*SD*	*DF*	*t*
Grade 2[a]				
Inclusion	1.65	16.10	42	-.97*
Noninclusion	6.11	14.38		
Grade 3[b]				
Inclusion	9.12	14.95	40	.89**
Noninclusion	5.39	12.07		
Group 4[c]				
Inclusion	.69	11.73	80	.52***
Noninclusion	-.49	8.83		

[a] n = 22 for each 2nd grade group. [b] n = 21 for each 3rd grade group. [c] n = 41 for each 4th grade group.

*p = .339 **p = .378 ***p = .607

Table 5

Results of Two-Tailed *t* Test of Mathematics Incremental Change Means by Treatment Group and Grade Level

Group	*M*	*SD*	*DF*	*t*
Grade 2[a]				
Inclusion	9.60	16.94	42	.61*
Noninclusion	6.45	17.38		
Grade 3[b]				
Inclusion	13.59	13.53	40	4.51**
Noninclusion	-4.49	12.44		
Group 4[c]				
Inclusion	4.00	14.01	80	.34***
Noninclusion	2.91	14.68		

[a] n = 22 for each 2nd grade group. [b] n = 21 for each 3rd grade group. [c] n = 41 for each 4th grade group.

*p = .545 **p = <.001 ***p = .732

The experimental and control groups were then broken into subgroups by sex to see if the incremental change means differed for boys and girls. Tables 6 and 7 show the *t* test results for Reading and Mathematics respectively.

Table 6

Results of Two-Tailed *t* Test of Incremental Change Means for Reading by Treatment Group and Sex

Group	*M*	*SD*	*DF*	*t*
Boys[a]				
Inclusion	8.63	15.66	72	1.94*
Noninclusion	2.22	12.62		
Girls[b]				
Inclusion	-1.34	11.01	92	-1.96**
Noninclusion	3.09	10.88		

[a] n = 37 in all groups of boys. [b] n = 47 in all groups of girls.

*p = .056 **p = .053

Table 7

Results of Two-Tailed *t* Test of Incremental Change Means for Mathematics by Treatment Group and Sex

Group	*M*	*SD*	*DF*	*t*
Boys				
Inclusion	7.18	12.12	72	2.64*
Noninclusion	-.73	13.59		
Girls				
Inclusion	8.41	17.18	92	1.24**
Noninclusion	4.13	16.33		

[a] $n = 37$ in all groups of boys. [b] $n = 47$ in all groups of girls.

*$p = .010$ **$p = .22$

Conclusions and recommendations drawn as a result of these data will be discussed in Chapter Four.

CHAPTER FOUR

Conclusions and Recommendations

Conclusions

This research study sought to retain the following hypothesis: The academic achievement of second, third, and fourth grade regular education students in noninclusion classrooms does not exceed that of similar students involved in special education inclusion programs. Further, what effect, if any, does participation in an inclusion program have on academic achievement of elementary regular education students?

Based upon the data gathered for this study, the above stated hypothesis is retained. The noninclusion regular education students did not exceed the academic growth of their counterparts who participated in inclusion programs on either Reading or Mathematics incremental change measures. Under the circumstances described for inclusion classrooms in this study, regular education students' academic achievement was not negatively impacted.

The two treatment groups were similar prior to treatment. There were 84 students in both the control (noninclusion) and experimental (inclusion) samples. Each sample contained the same number of males and females in second, third, and fourth grades. The *t* tests performed on the pretest Reading and Mathematics NCE means showed no significant differences between groups on pretest measures. Reading pretest mean

NCE score was 59.21(*SD* = 19.48) for the inclusion total sample and 58.87 (*SD* = 20.20) for the noninclusion total sample ($F = 1.08$, $DF = 166$, $p = .91$). Mathematics pretest mean NCE score was 61.05 (*SD* = 17.42) for the inclusion total sample and 61.11 (*SD* = 16.64) for the noninclusion total sample ($F = 1.10$, $DF = 166$, $p = .98$). Thus, as shown in Table 2, even though the noninclusion sample was selected by stratified random sample and not on a matched achievement basis, the two groups were very similar on their pretest means.

In order to assess the impact of treatment group on regular education achievement over a particular school year, incremental change was used to determine academic gain/loss. As shown in Table 3, there was no significant difference in Reading incremental change between treatment groups ($t = .17$, $F = 1.47$, $DF = 166$, $p = .86$). However, Mathematics incremental change was significantly higher for the inclusion group ($t = 2.51$, $F = 1.03$, $DF = 166$, $p = .01$). Since there were no significant differences in Reading or Mathematics pretest means (in fact, statistically very close), one can conclude that the experience of participating in an inclusion program was not detrimental to regular education students' academic achievement under the circumstances of this study.

One cannot assume that the significant positive Mathematics incremental change for the inclusion sample was due to their experimental group participation. In other words, the Mathematics gain was not necessarily due to

the inclusion treatment. Rather, the researcher would suggest that the difference existed because of the consistent use of a manipulative mathematics program to supplement the textbook in the inclusion cluster samples. Had this manipulative program been consistently used to teach curriculum concepts in all classrooms, the incremental gains/losses for Mathematics may have been more similar for the treatment groups.

When the data were broken out into grade levels by treatment, the inclusion samples progressed as well as or better than the noninclusion samples in all instances except for the second grade Reading incremental change (see Tables 4 and 5). However, the difference in second grade Reading was not statistically significant (t = -0.97, F = 1.25, DF = 42, p = .339). The only statistically significant difference within a grade level was in the third grade Mathematics incremental change mean. The inclusion group had a mean incremental change of 13.59 NCE (SD = 13.53), and the noninclusion third grade sample had a mean incremental change of -4.49 (SD = 12.44). The t test for third grade Mathematics incremental change showed a positive difference to the $p < .001$ level for the inclusion sample (t = 4.51, F = 1.18, DF = 40).

It should be noted that the varying levels of mean NCE incremental change among the three grades levels could be the result of factors other than the treatment experienced by each group. The small number of subjects in each grade level sample allows for more sampling error. Looking at grade level statistics as a subgroup of the total sample also allows more chance for a "teacher

effect" since the inclusion subjects were cluster sampled. The second and third grade inclusion subjects were all drawn from a single classroom at their respective grade level. Thus, the academic progress of those students may have been affected by the individual teachers' style and effectiveness as well as the inclusion experience. The subjects for all of the noninclusion samples came from a variety of classrooms, thus lessening the chance of teacher effect within these samples.

While recognizing the small sample sizes and possible bias of local factors, these data present some interesting trends when broken out by gender. Boys involved in inclusion programs show a statistically significant positive difference in Mathematics incremental change ($p = .01$) and very close to a significant difference in Reading growth ($p = .056$) when compared to boys in noninclusion rooms. The inclusion girls in this study showed a different pattern, however. There was a positive, but not significant ($p = .219$), trend for Mathematics incremental change for the female inclusion sample. Their Reading growth, on the other hand, showed a negative incremental change mean of -1.34 NCE. The female noninclusion sample showed a 3.09 NCE Reading gain; this difference approached the significant level ($p = .053$).

These differences in findings for males and females raise several questions (see Tables 6 and 7). Does inclusion, in fact, affect males and females differently? Is there a true difference for inclusion's impact upon females'

Reading and Mathematics achievement, or was the difference found here the result of sampling or other local factors?

This research study attempted to assess the impact on regular education achievement by inclusion programs in a particular elementary school. Results from two inclusion models were combined for the inclusion sample: one using a full-time team teaching approach and the other three classrooms using a part-time team teacher/part-time paraprofessional support model. Caution must be exercized in generalizing results from this study since data were drawn from only one elementary school. Since inclusion programs, by nature, must differ according to the needs of the included students as well as the school's personnel and resources, varying results may be found in other situations.

Recommendations

Based upon the data gathered for this study, concern for regular education students' academic progress should not deter educators from initiating/expanding special education full inclusion programs. As with any new type of educational programs, careful planning should be the cornerstone of inclusion programs designed to meet the needs of all students involved. An important component of the inclusion programs studied herein was the commitment of sufficient support personnel in the regular classroom; special education teachers and trained paraprofessionals were key partners in the success of these programs. When regular and special educators join together, special education children can benefit from a least restrictive environment in a regular classroom in their

neighborhood school without causing detriment to the academic progress of their regular education peers.

The supportive role of building and district administrators is crucial in the development of effective inclusion programs. Leaders with vision will help redefine their neighborhood school as the natural place for all children to be educated together, to the maximum extent possible. This evolution into a comprehensive local school will take time and commitment on the part of administrators, teachers, parents, and students. Administrators will need to provide time for special and regular education teachers to share ideas and plan jointly for their students. There also needs to be a commitment of resources to provide specialized training for teachers and paraprofessionals, both before and during the inclusion experience. Building administrators need to be well informed, proactive change agents who are willing to lead problem-solving processes to make things happen for children. For there will be problems which those involved will need to work out cooperatively. The teachers who move into inclusion are risk takers, and they will need morale support as they try new ideas.

As inclusion programs begin to take shape within a school/district, there is a need to define administrative policy to guide its implementation. Send Kids with Special Needs Out or Bring Specialized Staff In? A Fresh Look at Categorical Programs (Raynes, Snell, & Sailor, in press) is a helpful resource on this topic. Sailor, Gerry, and Wilson (1991) also provide an excellent exploration of

administrative policy considerations in Policy Implications of Emergent Full Inclusion Models for the Education of Students with Severe Disabilities.

There is a great need for additional research on the effects of full inclusion programs. The literature search conducted as background for this study revealed a dearth of information about inclusion programs and their effects upon academic achievement. Educators need more information about inclusion as it affects the academic growth of both regular and special education children in a variety of conditions: inclusion model used, type of special education student(s) included, size of school/district, grade level, as well as various socioeconomic, geographic, and ethnic factors. More research into the possible differences in impact upon males and females would also be in order.

Areas other than academic achievement should also be explored. The effects of full inclusion on the social interaction of students is an important area to address. This research might take the form of determining the impact upon amount and type of interaction between regular and special education children. It would be helpful to educators to determine what factors positively affect interaction in an inclusion setting. Research concerning the attitudes of regular and special education students about each other, their self-esteem, and their participation in an inclusion program would also provide valuable information for future planning.

There is a need to research what type of teaching strategies lead to student success in integrated classrooms. Are there differences in the ways teachers

organize curriculum and use materials? Are there differences in expectations for all students or in how students spend their class time between inclusion and noninclusion settings?

An unexpected finding of this study was the positive effect of combining a manipulative mathematics program with the textbook to teach basic curriculum concepts. Further research into the effects of manipulative programs on mathematics growth would be in order. The results of the current study would seem to encourage the consistent use of manipulatives in all elementary classrooms.

A final recommendation is that all educators considering the development/ expansion of special education inclusion programs search out as much information as possible about the effects of inclusion on both regular and special education students. Many of the sources listed in the reference section of this document will help in that effort. Practical guidance for elementary educators is provided in Students with Significant Challenges: Choosing and Developing Integrated Activities in the Elementary School (Graham, Gee, Lee, Goetz, and Beckstead, 1987).

References

Affleck, J. Q., Madge, S., Adams, A., & Lowenbraun, S. (1988). Integrated classroom versus resource model: Academic viability and effectiveness. (ERIC Document Reproduction Service No. EJ 364 845)

Baker, J. M., Padeliadu, S., & Zigmond, N. (1990). From self-contained pullout programs to full-time mainstreaming: The perspective of the learning disabled students. Paper prepared for annual Council for Exceptional Children conference, Toronto, ON.

Baker, J. & Zigmond, N. (1990, April). Mainstreaming learning disabled students: The impact on regular education students and teachers. Paper presented at the Annual Meeting of the American Educational Research Association, Boston. (ERIC Document Reproduction Service No. 320 373)

Beekman, L. (1990). LRE (Alias inclusive education, REI and mainstreaming): Legal and related implications. Statewide Communications and Dissemination Service Newsletter, May, 12-14.

Brown v. Board of Education, 347 U. S. 483 (1954).

CTB/McGraw-Hill. (1986). California Achievement Test. Monterey California: CTB/McGraw-Hill.

Epps, S. & Tindal, G. (1987). The effectiveness of differential programming in serving students with mild handicap: Placement

options and instructional programming. In M. C. Wang, M. C. Reynolds & H. J. Walberg (Eds.). Vol. 1, Learner characteristics and adaptive education. New York: Pergamon Press.

Forest, M. (1988). Full inclusion is possible. Minnesota Impact, 1, 3-4.

Forest, M. & Lusthaus, E. (n.d.). The kaleidoscope: Each belongs--Quality education for all. Unpublished manuscript.

Gartner, A. & Lipsky, D. K. (1987). Beyond special education: Toward a quality system for all students. Harvard Educational Review, 57, 367-395.

Graham, N., Gee, K., Lee, M., Goetz, L. & Beckstead, S. (1987). Students with significant challenges: Choosing and developing integrated activities in the elementary school. San Francisco: California Research Institute on the Integration of Students with Severe Disabilities, San Francisco State University.

Instructional Materials Laboratory. (1989a). Class Within a Class staff development workshop elementary implementation manual. Columbia, Mo.: University of Missouri-Columbia.

Instructional Materials Laboratory. (1989b). Class Within a Class staff development workshop elementary participant workbook. Columbia, Mo.: University of Missouri-Columbia.

Instructional Materials Laboratory. (1989c). Class Within a Class staff development workshop elementary presenters manual. Columbia, Mo.: University of Missouri-Columbia.

Johnson, D. W. (1982). Experiments to attain full participation of handicapped students in the regular classroom. Final report. (ERIC Document Reproduction Service No. ED 245 514)

Johnson, D. W. & Johnson, R. T. (1982). Effects of cooperative and individualistic instruction on the relationships and performances of handicapped and nonhandicapped students. In D. W. Johnson Experiments to attain full participation of handicapped students in the regular classroom. (ERIC Document Reproduction Service No. ED 245 514).

Kelly, D., Karasoff, P., & Haring, K. (1990). Schools are for all kids: Perspectives from principals [videotape]. San Francisco: California Research Institute on the Integration of Students with Severe Disabilities, San Francisco State University.

Kishi, G. (1989). SAT scores for a school complex: Pre- and post-integration. Paper presented at the Association for Persons with Severe Handicaps Annual Meeting, San Francisco.

Kozleski, E. (1988). Evaluation study: The integration project pilot at Niwot Elementary School. Denver: University of Colorado.

Larter, S. E. (1982). The physically handicapped and health impaired children: Do they prosper in regular Toronto elementary schools? (ERIC Document Reproduction Service No. ED 227 641)

Leinhardt, G., Bickel, W., & Pallay, A. (1982). Unlabeled but still entitled: Toward more effective remediation. Teachers College Record, 84, 391-423.

LeRoy, B. (1990). The effect of classroom integration on teacher and student attitudes, behaviors, and performance in Saline Area Schools. Detroit: Wayne State University, Developmental Disabilities Institute, Center for Inclusive Education.

LeRoy, B. (n.d.) Inclusive education: Research bibliography. Detroit: Wayne State University, Developmental Disabilities Institute.

Lipsky, D. K. & Gartner, A. (Eds.). (1989). Beyond separate education: Quality education for all. Baltimore: Paul H. Brookes Publishing Co.

Madden, N. A. & Slavin, R. E. (1983). Mainstreaming students with mild handicaps: Academic and social outcomes. Review of Educational Research, 53, 519-569.

Marchetti, D. (1991, January 20). Special students join regular classes. The Detroit News and Free Press, pp. 1c-2c.

Mills v. Board of Education, 348 F. Supp. 866, (1972).

Morrow, D. (1990). Class Within a Class: An experimental program in Missouri brings special education teachers into mainstream classes. Counterpoint, 11 (2), 11.

Odom, S. L., DeKlyen, M., & Jenkins, J. R. (1984). Integrating handicapped and nonhandicapped preschoolers: Developmental impact on nonhandicapped children. Exceptional Children, 51, 41-48.

Pennsylvania Association of Retarded Citizens (PARC) v. Commonwealth of Pennsylvania, 334 F. Supp. 1257 (1971).

Powell, G. (1990). Inclusive Education in Washtenaw County. Ann Arbor, Michigan: Washtenaw Intermediate School District:

Public Law 94-142: The Education of all Handicapped Children Act of 1975. (1975). Washington, DC: U. S. Government Printing Office.

Raynes, M., Snell, M. E., & Sailor, W. (In press). Send kids with special needs out or bring specialized staff in? A fresh look at categorical programs. San Francisco: California Research Institute on the Integration of Students with Severe Disabilities: San Francisco State University.

Reid, R. (1987). Homecoming: The benefits of educating learning impaired students in their local schools with their non-disabled peers. The Decision Maker, Center for Developmental Disabilities, University of Vermont, Fall.

Sailor, W. (1989). The educational, social, and vocational integration of students with the most severe disabilities. In D. K. Lipsky & A. Gartner (Eds.), Beyond separate education: Quality education for all. Baltimore: Paul H. Brookes Publishing Co.

Sailor, W., Anderson, J. L., Halvorsen, A. T., Doering, K., Filler, J., & Goetz, L. (1989). The comprehensive local school: Regular education for all students with disabilities. Baltimore: Paul H. Brookes Publishing Co.

Sailor, W., Gerry, M., & Wilson, W. C. (1991). Policy implications of emergent full inclusion models for the education of students with severe disabilities. In M. Wang, H. Walberg, & M. Reynolds (Eds.), The handbook of special education (vol. IV). Oxford, England: Pergamon Press.

Sailor, W., Goetz, L., Anderson, J., Hunt, P., & Gee, K. (1988). Research on community intensive instruction as a model for building functional, generalized skills. In R. Horner, G. Dunlap & R. Koegel (Eds.), Generalization and maintenance: Lifestyle changes in applied settings (pp. 67-98). Baltimore: Paul H. Brookes Publishing Co.

Sapon-Shevin, M. (1988). Working towards merger together: Seeing beyond distrust and fear. (ERIC Document Reproduction Service No. EJ 387 267)

Smith, K., Johnson, D. W., & Johnson, R. (1982). Effects of cooperative and individualistic instruction on the achievement of handicapped, regular, and gifted students. The Journal of Social Psychology, 116, 277-283.

Stainback, S. & Stainback, W. (1989). Integration of students with mild and moderate handicaps. In D. K. Lipsky & A. Gartner (Eds.), Beyond

separate education: Quality education for all (pp. 41-52). Baltimore: Paul H. Brookes Publishing Co.

TexaSoft/Mission Technologies. (1988). Kwikstat 2.00. Cedar Hill, Texas: TexaSoft.

Thousand, J. (1987). Effectively integrating students with moderate/ severe handicaps into their local schools and communities. The Decision Maker, Center for Developmental Disabilities, University of Vermont, Fall.

Trimer, M. (1990, October 20). Disabilities don't have to separate students. The Detroit News and Free Press, pp. 1A, 11A.

Viadero, D. (1989). Side by side. Teacher Magazine, 1(2), 40-48.

Wang, M. C. & Baker, E. T. (1985). Mainstreaming programs: Design features and effects. The Journal of Special Education, 19, 503-521.

Wang, M. C. & Birch, J. W. (1984). Comparison of a full-time mainstreaming program and a resource room approach. Exceptional Children, 50, 391-398.

Will, M. (1986). Educating students with learning problems: A shared responsibility. Report to the Secretary, Washington, DC: U. S. Department of Education, Office of Special Education and Rehabilitation Services.

Zigmond, N. & Baker, J. (1990). Mainstream experiences for learning disabled students (Project MELD): Preliminary report. Exceptional Children, 57, 176-185.